UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/820,339	03/29/2001	Sara Fuchs	FUCHS=2A	3100

1444 7590 01/30/2003

BROWDY AND NEIMARK, P.L.L.C.
624 NINTH STREET, NW
SUITE 300
WASHINGTON, DC 20001-5303

EXAMINER
HAYES, ROBERT CLINTON

ART UNIT	PAPER NUMBER
1647	11

DATE MAILED: 01/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/820,339	Applicant(s) Fuchs et al
	Examiner Robert C. Hayes, Ph.D.	Art Unit 1647

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Oct 30, 2002* .

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above, claim(s) *1-7, 10, 11, 13, and 20-22* is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *8, 9, 12, and 14-19* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☒ Claims *1-22* are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☒ None of:

1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). *1*
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Election/Restriction

1. Applicant's election with traverse of Group II as it relates to SEQ ID Nos: 1 & 2 (i.e., claims 8 & 9 (iii & v-x), 12 & 14-19) in Paper No. 10 is acknowledged. The traversal is on the ground(s) that "at least SEQ ID NO:1 which encodes for the amino acid sequence SEQ ID NO:2 should be examined together with SEQ ID NO:2". The Examiner agrees, so SEQ ID NO:1 will also be examined. Applicants then argue that the remaining "sequences are structurally and functionally similar". This is not found persuasive because SEQ ID Nos: 1 & 2 do not contain the inserted amino acid sequences which make these sequences unique, and therefore, require separate searches for these unique sequences. The requirement is still deemed proper and is therefore made FINAL.

Claims 1-7, 8i-ii & iv, 9i-ii & iv, 10-11, 13 & 20-22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 10.

This application contains claims 1-7, 8i-ii & iv, 9i-ii & iv, 10-11, 13 & 20-22 drawn to inventions nonelected with traverse in Paper No. 10. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144), such as rewriting the claims to only the elected invention. See MPEP § 821.01.

Claim Rejections - 35 U.S.C. § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 8-9 & 17 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. For example, the current recitation of "a DNA" encompasses all naturally occurring polynucleotides encoding acetylcholine receptor proteins; thereby, not involving the hand of man to isolate or purify the DNA molecule. It is suggested that amending the claims to "an isolated DNA molecule" should obviate the rejection of claims 8-9.

Additionally, the current recitation of an "eukaryotic host cell" encompasses a human organism. It is suggested that amending the claims to "isolated eukaryotic host cell" should obviate the rejection of claim 17.

Claim Rejections - 35 U.S.C. § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 8-9, 12 & 14-19 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey

to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification solely describes the human polypeptides of SEQ ID Nos: 2, 6 and 8, the DNA that encode such, and that residue #s 1-210 of SEQ ID NO:2 represent the extracellular domain of the acetylcholine receptor (AchR) α-subunit. Although specific fragments that "consist of" residues 1-121, 122-210 and 1-205 of SEQ ID NO:2 are also described that may be useful in "modulating the autoimmune response of an individual to [the] acetylcholine receptor", no other encoded AchR polypeptides nor functional fragments are described. Nor does the specification describe any DNA molecules that encode polypeptides from any other "non-human" species (e.g., pg. 30 of the specification). Nor are any generic molecules that are merely "at least 70% homologous" described. Moreover, with the exception of encoded fusion polypeptides that increase "solubility" or create a "protease target sequence" for "further processing" (e..g, see pg. 30 of the specification), no other fusion sequences are described, in which especially no DNA sequences encoding any putative fusion or "spacer" sequences are described. In other words, no adequate written description of what constitutes any different species, allelic variant (i.e., as both encompassed by the recitation of "at least 70%), or different open reading frame that merely "comprise" fragments of SEQ ID NO:1, or that comprise sequences that code generic heterologous polypeptides (i.e., as currently interpreted by the recitation of "coding", etc.) fused to random fragments of SEQ ID NO:2, are provided within the instant specification. The specification fails to describe what critical encoded amino acids define

any distinguishable and assayable AchR function/activity or what critical encoded amino acid residues define functional "epitope-bearing portions"/ putative "autoimmune modulating" portions of SEQ ID NO:2. Nor could one skilled in the art reasonably visualize what constitutes such generic heterologous DNA molecules encompassed by these claims, as currently and broadly claimed; thereby, not meeting the written description requirements under 35 U.S.C. 112, first paragraph.

Applicant is directed toward the Revised Interim Utility and Written Description Guidelines, Federal Register, Vol.64, No.244, pages 71427-71440, Tuesday December 21, 1999.

4. Claims 8-9, 12 & 14-19 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the specific DNA of SEQ ID NO:1 encoding the polypeptide of SEQ ID NO:2, does not reasonably provide enablement for any encoded biological functional equivalent polypeptides/ fragments with little structural characterization and no distinguishable recited functional characteristics. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The specification describes the DNA of SEQ ID NO:1 encoding the polypeptide of SEQ ID NO: 2 as potentially being "capable of" modulating the autoimmune response manifested in myasthenia gravis (e.g., see pages 3-4 of the specification). However, the recitation of being "capable of" does not require such function, and the recitation of "modulating" does not define

whether the DNA increases or decreases an "autoimmune response". Additionally, the name "DNA coding"/ comprising or "comprising two or more fragments... fused together..." or "polypeptides comprising an amino acid sequence which is at least 70% identical..." or "denatured forms" or "chemical derivatives and salts of" does not sufficiently characterize and enable the polynucleotides that are encompassed by these claims, because the inclusion of any random mutations or "added, deleted or substituted" encoded amino acid residues to polypeptides or fragments thereof with no definable and assayable function sets forth little structural and functional characteristics. In contrast, the specification does not teach which particular encoded amino acids are critical for any AchR protein's function, nor how to distinguish such from any different encoded polypeptide sequence that possesses none of the desired functions of the instant invention. Moreover, random mutations and/or random "addition, deletion or substitution variants of different encoded AchR-related polypeptides would be expected by the skilled artisan to result in generation of inactive encoded proteins, and result in encoded epitopes that may either cross react with different proteins, or no longer be recognized by any putative autoimmune antibody. For example, Geysen et al. teach that random amino acid changes to a tetrameric peptide/epitope, which includes conservative substitutions to the same antigen, have "frequently been associated with loss of antibody binding" (e.g., pg. 38, 1st col., 2nd *pp*). Thus, the lack of guidance provided in the specification as to what minimal structural requirements are necessary for any functional DNA molecule, or a DNA molecule that putatively encodes a sequence required for a specific AchR antibody binding reaction, would prevent the skilled artisan from

determining whether any modification or mutation or truncation to the human AchR sequence of SEQ ID NO:1 could be made that successfully results in generation of the desired antibody blocking peptides of the instant invention, because any random mutation or modification manifested within an AchR protein itself would be predicted to adversely alter its biologically active 3-dimensional conformation, and therefore, the antigenic site itself, without undue experimentation to determine otherwise.

5. Claims 8-9, 12 & 14-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is ambiguous how DNA can code for "denatured forms, chemical derivatives and salts of" a polypeptide. In contrast, DNA merely encodes polypeptides, and not any subsequent reactions that may occur to the encoded polypeptide; thereby, confusing what exactly is being claimed.

A method of producing a denatured protein makes little sense (i.e., as it relates to claim 18).

It is also unclear what exactly is envisioned by the recitation, "vehicle", versus vector, plasmid, etc.; thereby, being indefinite (i.e., as it relates to claim 16).

Claim Rejections - 35 U.S.C. § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 8-9, 12, 14 & 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Schoepfer et al. (1988).

Schoepfer et al. teach isolation of a human AchR DNA that encodes a polypeptide inherently capable of modulating the autoimmune response of an individual to the acetylcholine receptor, which comprises the nucleotides 1 to 363 and nucleotides 364 to 630 of SEQ ID NO:1, as well as the fusion of any or all fragments of SEQ ID NO:1 (i.e., pg. 237-238, Fig. 3; as it relates to claims 8-9, 12 & 14). Schoepfer's DNA is cloned in prokaryotic expression plasmid/vector/ vehicle, λzap, and transfected in *E. coli* host cells (i.e., pgs. 236 & 238; as it relates to claims 16-17). A method of producing and isolating the expressed protein was also taught by Schoepfer et al., which is a fusion of the fragments of SEQ ID NO:1 listed above (e.g. pgs. 238-239, Table 1; as it relates to claims 18-19).

7. Claims 8-9, 12, 14 & 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Talib et al. (1991; IDS Ref #AM).

Talib et al. teach isolation of a human AchR DNA that encodes a polypeptide inherently capable of modulating the autoimmune response of an individual to the acetylcholine receptor, which comprises the nucleotides 1 to 363 and nucleotides 364 to 630 of SEQ ID NO:1, as well as the fusion of any or all fragments of SEQ ID NO:1 (i.e., pg. 290, Fig. 1; as it relates to claims 8-9, 12 & 14). Talib's DNA is cloned in prokaryotic expression plasmids/vectors/vehicles, pUC18, pKK223-3, etc., and transfected in *E. coli* host cells (i.e., pgs. 289-291, Fig. 2; as it relates to claims 16-17). A method of producing and isolating the expressed protein was also taught by Talib et al., which is a fusion of the fragments of SEQ ID NO:1 listed above (e.g. pg. 290, 293, Figs. 3 & 4; as it relates to claims 18-19).

Information Disclosure Statement

8. The information disclosure statement filed 3/29/01 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Robert Hayes whose telephone number is (703) 305-3132. The examiner can normally be reached on Monday through Thursday, and alternate Fridays, from 8:30 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Kunz, can be reached on (703) 308-4623. The fax phone number for this Group is (703) 308-4242.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

Robert C. Hayes, Ph.D.
January 23, 2003

GARY KUNZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600